GEO EUROPEAN PROJECTS' WORKSHOP-7

Barcelona
15-16 April 2013

GROUP ON EARTH OBSERVATIONS

Institutional projects from a private sector perspective

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Altamira Information

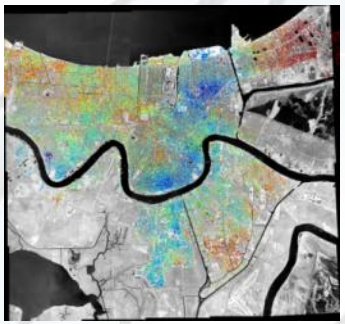
Introduction to Altamira Information

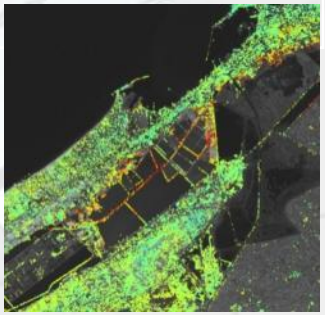
ALTAMIRA INFORMATION is an experienced EO company that provides ground deformation measurements with millimetric precision and mapping solutions using satellite images.

- **ALTAMIRA** was founded in Barcelona in 1999 and opened offices in Toulouse (France) and Calgary (Canada) – part of the **CLS group** since 2010
- The team brings together more than 35 staff with wide **InSAR** technical and scientific background.
- ALTAMIRA services are provided using its own PSInSAR software: the **Stable Point Network** processing chain (SPN).

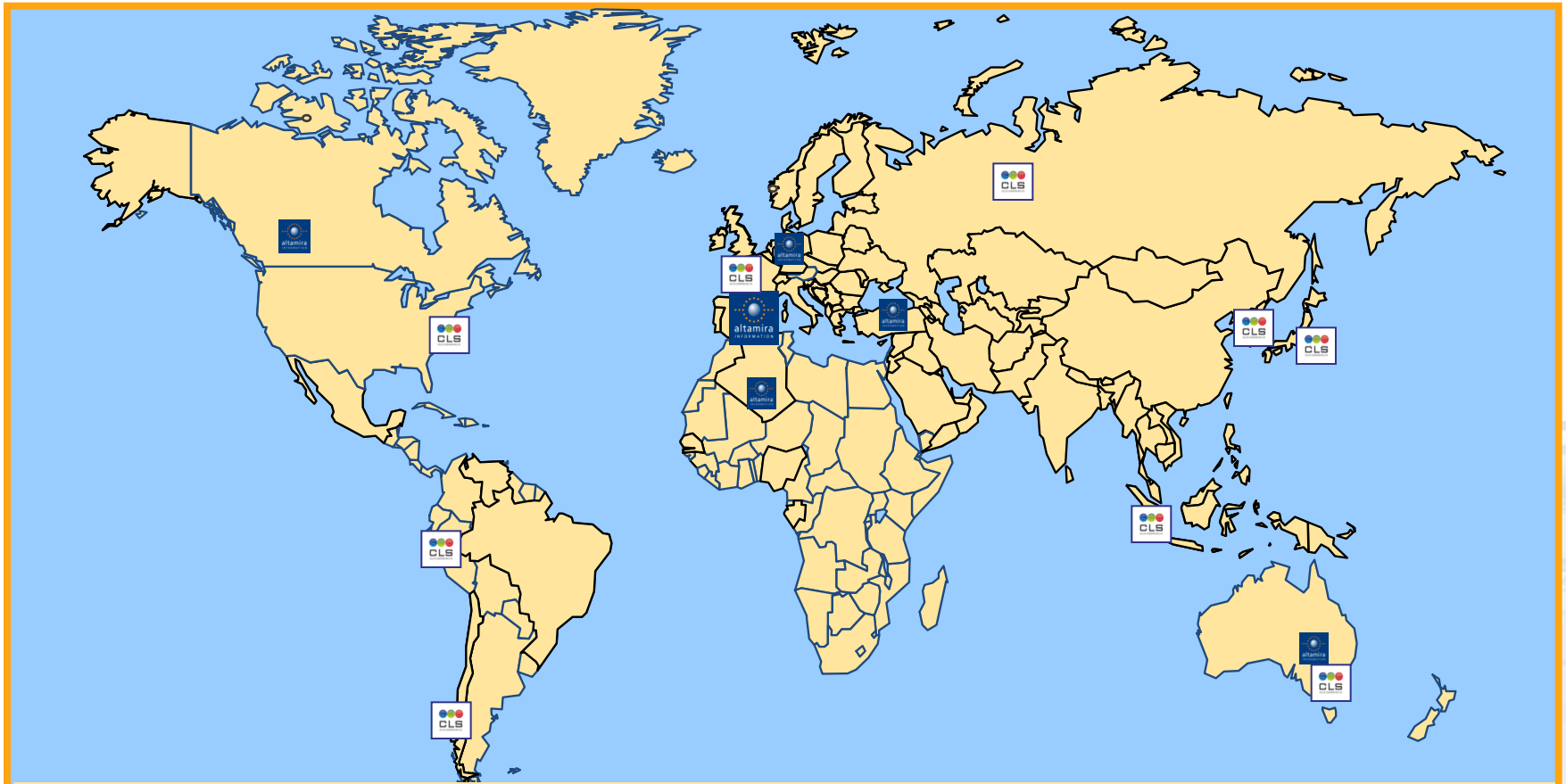
- Main clients in the domain of infrastructures, mining and Oil and Gas

- **Institutional and Cooperation projects**:
  - Support for Natural Hazards in New Orleans Katrina's Hurricane (CSA, USGS, NASA)
  - Support for Climate Change studies in Alexandria 2009-2010 (World Bank)





Our branches & worldwide presence



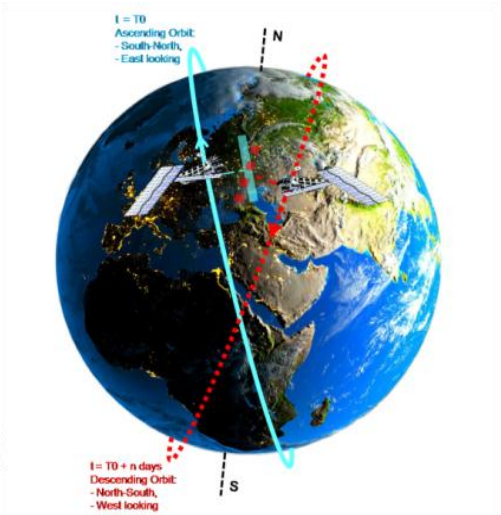
Altamira Information brings together a team of engineering experts in InSAR technology. With headquarters based in Barcelona (Spain) and 12 branches worldwide we are currently expanding with agents into new areas.

The proposed service – Ground motion measurement

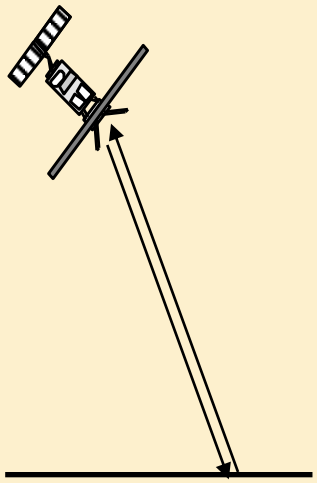
Radar satellites

Interferometric = Superimposition of waves to detect differences

Synthetic
Aperture = High resolution radar system
Radar

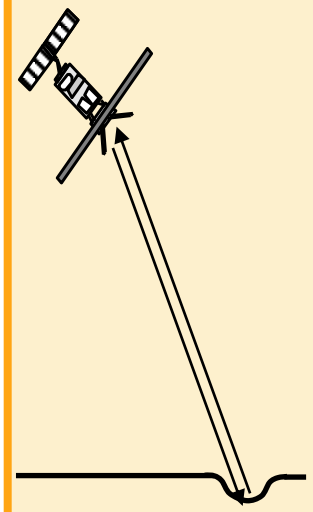


1st satellite pass
1st measurement



Reference distance between sensor and ground measured with millimetric precision

2nd satellite pass
2nd measurement

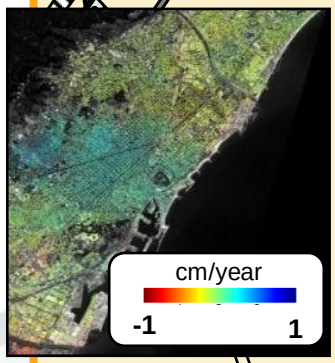


Detecting a change of distance between sensor and ground indicates movement

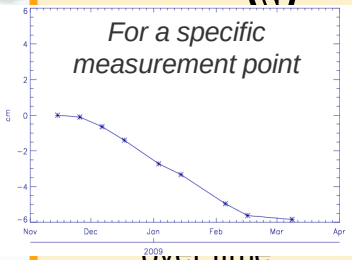
Nth satellite pass
Nth measurement

Results

Ground motion measurements map



Time series for each point over time



Ground movement is measured with radar satellites, comparing the distance between the sensor and the ground surface at different moments in time.

Main Application Sectors

Infrastructures






- Infrastructures (railway, ports, tunnel, metro, bridges..) monitoring
- Planning, construction

Mining






- Open pit mines and slopes
- Underground mines
- Infrastructures (dump areas, tailing dams…)

Oil & Gas






- Reservoirs and pipelines monitoring
- Unconventional gas storage
- LNG terminals…

Institutional






- Natural Hazards mitigation
- Safety improvement
- Hazard information services (floods, climate changes…)

Institutional and Cooperation projects

- Organised following 3 main domains of applications:

Terrain deformation Mapping

- Landslides
- Risk Information / Natural Hazards

Cartography

Marine applications

Doris

TERRAFIRMA

SOurce Monitoring System: BIOdiversity multi- BIO SOS from space to species
EEC FP7- Space - 2010.1.1-04

myOcean

LAMPRE
LAndslide Modelling and tools for vulnerability assessment Preparedness and REcovery management

safer
Services and Applications For Emergency Response

PanGeo

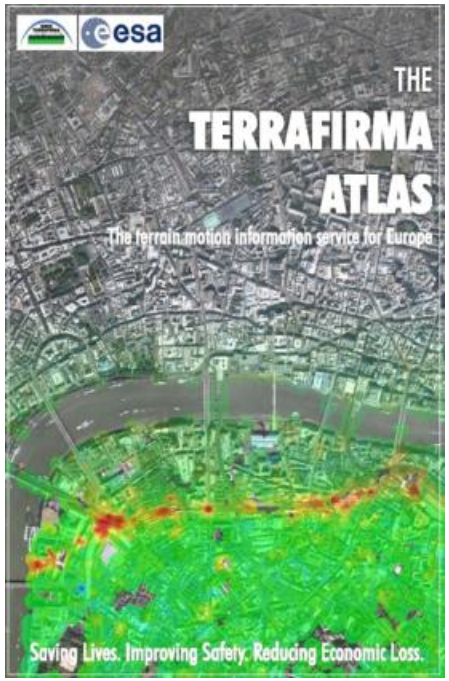
eoworld
Earth Observation for Development

eoeuropa
earth observation for development

GeoViQua GRUMETS UAB CREAF MiraMon

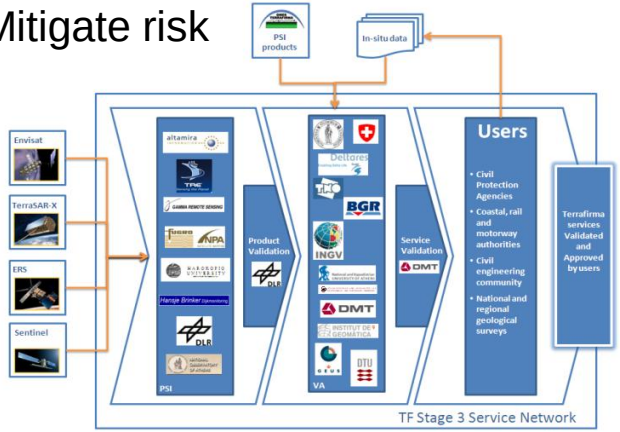
A Success Story…

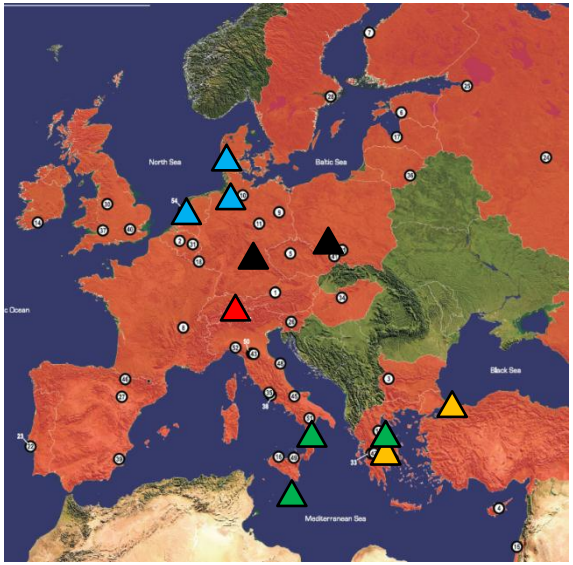
Terrafirma is one of the services supported by the European Space Agency's (ESA) Global Monitoring for Environment and Security (GMES) Service Element Programme



- Terrafirma provides a ground motion hazard information service, distributed throughout Europe via national geological surveys and institutions.

- The objective of this service is to help
  - Identify hazards
  - Improve safety,
  - Mitigate risk





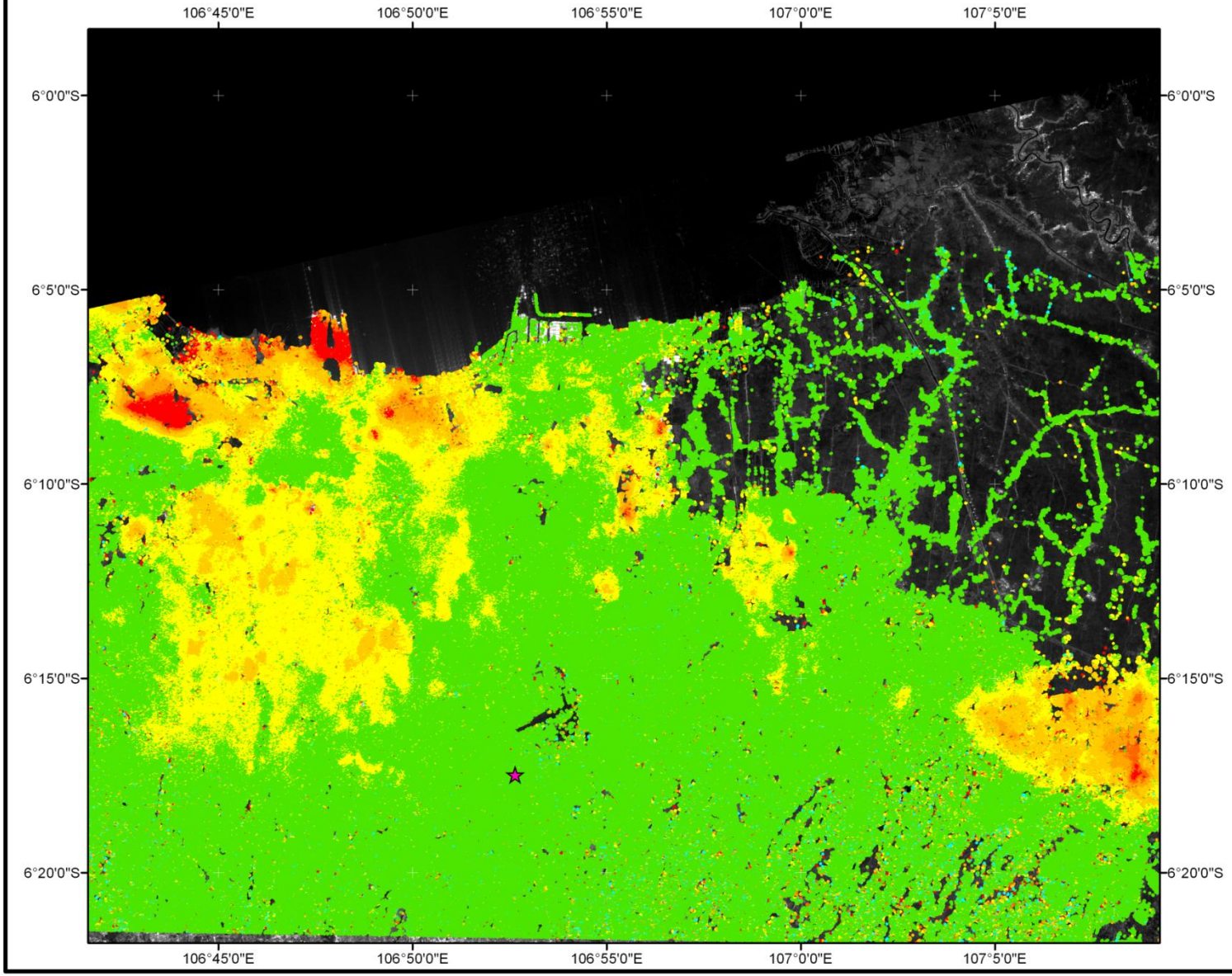
ALTAMIRA INFORMATION has been appointed by ESA as leader of the Terrafirma project: bringing together a consortium of 20 European experts in Earth Observation, Geological Surveys, and specialists in landslides, hydrogeology, tectonics and flooding.

Analysis of Land subsidence in Jakarta

- EOWorld project aims at demonstrate the utility of the EO-based services within World Bank projects.
- Altamira has led 3 of the 12 pilot projects defined within the partnership.
- Main theme is the **Urban Risk Management** with subsidence problems in coastal lowland areas prone to flooding and flood defence systems.

Region of interest	Project Title
Latin America Caribbean	Building Flood Defence Systems in **Guyana**
East Asia Pacific	Multi-Hazard Vulnerability Assessment in **Ho Chi Minh City** and **Yogyakarta**
East Asia Pacific	Analysis of Land Subsidence of **Jakarta**

Terrain Deformation Measurements in Jakarta based on the PSI analysis of ALOS PALSAR data (2007-2011)



eoworld
Earth Observation for Development

Location

Legend - Displacement rate (in mm/yr)

- ALOS meas. reference point
- more than -75.0
- from -75.0 to -60.0
- from -60.0 to -45.0
- from -45.0 to -30.0
- from -30.0 to -15.0
- from -15.0 to 15.0
- from 15.0 to 30.0
- from 30.0 to 45.0
- from 45.0 to 60.0
- from 60.0 to 75.0
- more than 75.0

Interpretation

World Bank is currently preparing a project to mitigate flood risk in the city of Jakarta. To achieve this, geo-information is needed concerning flood hazard (coastal flood, sea water intrusion, etc) and risk assessment. This includes an assessment of the hydraulic network and investigations of possible land subsidence in the urban & per-urban area of the city of Jakarta.
The present service aims to contribute to this project by generating land motion mapping over the AOI by exploiting Medium Resolution Radar sensors through the "Persistent Scatterer Interferometry" (PSI) technique.

The map represents the deformation rate in the AOI, derived from the analysis of 20 ALOS images, acquired over 4 years, from 2007 to beginning 2011. The results are overlaid on the mean reflectivity image computed considering the ALOS data stack. The centre-southern District of Jakarta, the Jakarta Bay and the suburban District of Cikarang show subsidence rates up to -75 mm/year over the monitoring period.

Local Projection: UTM zone 48 South
Datum: WGS 1984

1:180,000

N

Data sources

InSAR Results derived from the use of 20 ALOS images acquired from 2007 to 2011.

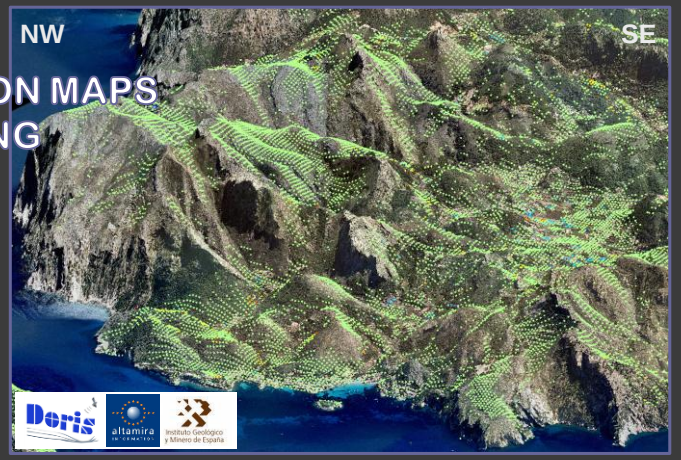
The aim of EOWORLD is to produce, deliver and assess the benefits of EO-based geo-information services in support of on-going World Bank project activities. This work forms part ESA's efforts to raise awareness within the World Bank of European and Canadian EO missions (both ESA and national), and the capabilities of EO service providers to provide information customised to the needs of individual projects. The World Bank together with ESA have identified 12 specific EOWORLD Actions for which EO-based information has significant potential.

altamira INFORMATION

esa THE WORLD BANK

LANDSLIDES IN MALLORCA

GROUND DEFORMATION MAPS
SPN PROCESSING



ERS | 13/06/1992 – 07/11/2000

mm/yr

6 4 3 2 2 3 4 6

Subsidence Stability Uplift

ALOS | 04/01/2007 – 30/05/2010

mm/yr

15 13 10 5 5 10 13 15

Subsidence Stability Uplift

RESULTS INTERPRETATION

LANDSLIDE CLASSIFICATION MAP

ERS | 1992 – 2000

mm/yr

10 6 3 0

ALOS | 2006 – 2010

mm/yr

60 30 20 10 5 0

SEVENTH FRAMEWORK PROGRAMME

Grant Agreement n. 242212 – www.DORIS-PROJECT.eu

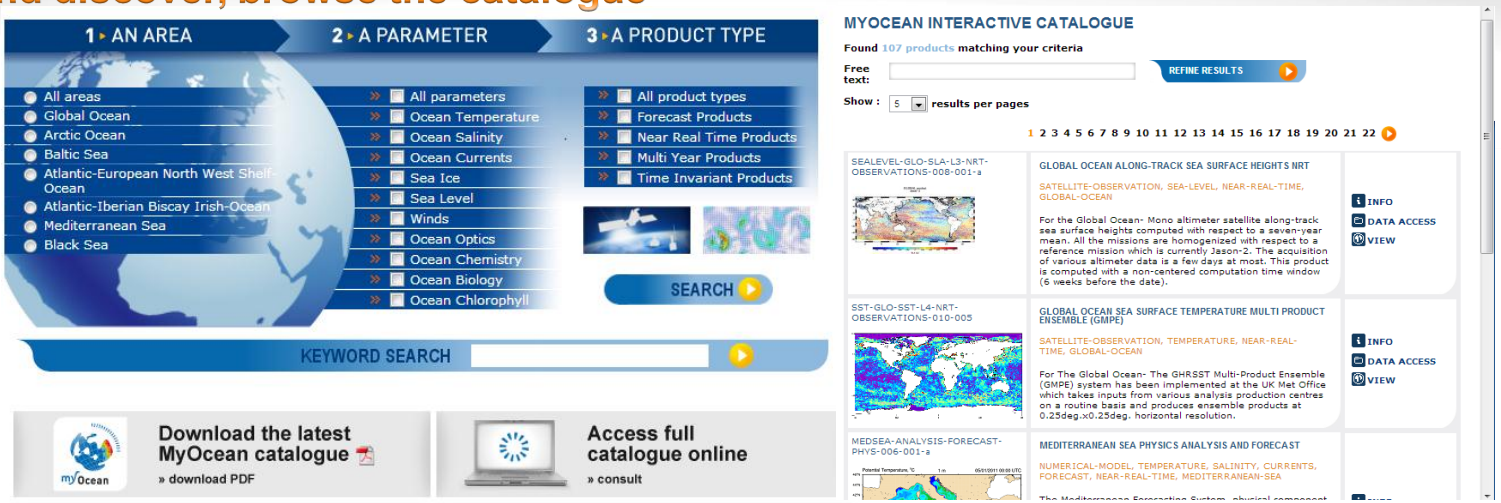
MyOcean project

- Pan-European project for an operational marine service, a joint effort of more than 60 partners
- The MyOcean catalogue counts with **more than 100 oceanographic products** that include in-situ, modelling, and earth observation data sources.
- Today, it serves **over 2000 users** with an average of **52000 download requests per month**
- On April 23rd, MyOcean V3 will be released.

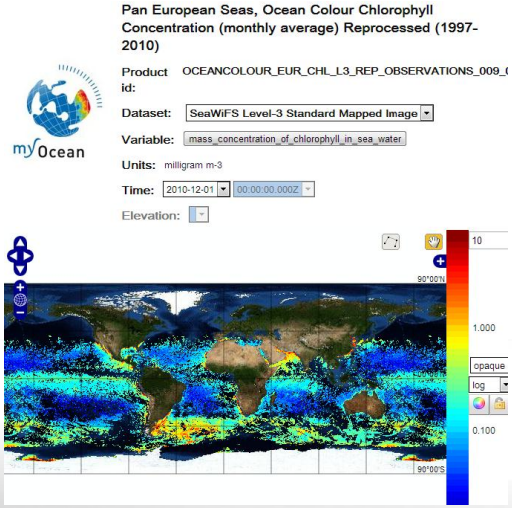
- Altamira contributes to:
  - WP16 ⇨ Central Information System: responsible for the web portal and applications for the distribution of oceanographic data.
  - WP2.3 ⇨ Service Engineering: design of human processes, service integration and verification

Web Portal www.myocean.eu

Search and discover, browse the catalogue



View



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Conclusion

- From a strategic commercial perspective, FP7 funds shall not represent a mere source of income but a key contribution in terms of:
  - Trans-national research cooperation
  - Achievement of scientific excellence as a backbone for technological development
  - Addressing of research towards future market demand

- Institutional projects commonly fluctuate between 5 and 10% of Altamira's yearly revenue

- In return, as a representative of commercial markets, we shall:
  - strongly contribute to the **transfer of industrial needs** among multidisciplinary research groups
  - pitch in innovation and **enhance competitiveness**

Thank you for your attention

Javier Duro
Head of Research and Development

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